

CLAIMS

What is claimed is:

1. An isolated nucleic acid molecule selected from the group consisting of:
 - 5 a) a nucleic acid molecule having a nucleotide sequence which is at least 90% identical to the nucleotide sequence of any of SEQ ID NOS: 1, 2, 31, 32, 51, 52, 71, 72, 81, 82, 91, 92, 96, 97, 101, 102, 106, 107, 111, 112, 121, 122, 141, 142, 151, 152, 161, 162, 171, 172, 181, 182, 191, 192, 201, 202, 215, 217, 221, 222, 241, 242, 251, 252, 271, 272, 279, 280, 303, 304, 308, 309, 324, 325, 329, 330, 351, 352, 362, 10 371, 372, 379, 380, 387, 388, 403, 404, 415, 416, 423, 424, 437, 438, and the nucleotide sequence of any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a complement thereof;
 - 15 b) a nucleic acid molecule comprising at least 15 nucleotide residues and having a nucleotide sequence identical to at least 15 consecutive nucleotide residues of any of SEQ ID NOS: 1, 2, 31, 32, 51, 52, 71, 72, 81, 82, 91, 92, 96, 97, 101, 102, 106, 107, 111, 112, 121, 122, 141, 142, 151, 152, 161, 162, 171, 172, 181, 182, 191, 192, 201, 202, 215, 217, 221, 222, 241, 242, 251, 252, 271, 272, 279, 280, 303, 304, 20 308, 309, 324, 325, 329, 330, 351, 352, 362, 371, 372, 379, 380, 387, 388, 403, 404, 415, 416, 423, 424, 437, 438, and the nucleotide sequence of any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a complement thereof;
 - 25 c) a nucleic acid molecule which encodes a polypeptide comprising the amino acid sequence of any of SEQ ID NOS: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-100, 103-105, 108-110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-185, 193-198, 203-214, 216, 223-236, 243-252, 253, 273-278, 281-302,

305-307, 310-315, 326-328, 331-333, 353-358, 363-368, 373-378, 381-386, 389-
394, 405-414, 417-422, 425-436, and 439, and the amino acid sequence encoded by
the nucleotide sequence of any of the clones deposited as ATCC® Accession
numbers 207184, 207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150,
5 PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-
1764;

d) a nucleic acid molecule which encodes a fragment of a polypeptide
comprising the amino acid sequence of any of SEQ ID NOs: 3-8, 33, 35, 38, 53-60,
73-78, 83-85, 93-95, 98-100, 103-105, 108-110, 113-115, 123-131, 143-145, 153-
10 160, 163, 173-175, 183-185, 193-198, 203-214, 216, 223-236, 243-252, 253, 273-
278, 281-302, 305-307, 310-315, 326-328, 331-333, 353-358, 363-368, 373-378,
381-386, 389-394, 405-414, 417-422, 425-436, and 439 and the amino acid sequence
encoded by the nucleotide sequence of any of the clones deposited as ATCC®
Accession numbers 207184, 207219, 207220, 207221, 207228, 207230, PTA-147,
15 PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156,
and PTA-1764, wherein the fragment comprises at least 10 consecutive amino acid
residues of any of SEQ ID NOs: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-100,
103-105, 108-110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-185,
193-198, 203-214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307, 310-
20 315, 326-328, 331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-414,
417-422, 425-436, and 439 and the amino acid sequence encoded by the nucleotide
sequence of any of the clones deposited as ATCC® Accession numbers 207184,
207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295,
PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764; and

25 e) a nucleic acid molecule which encodes a fragment of a polypeptide
comprising the amino acid sequence of any of SEQ ID NOs: 3, 53, 73, 83, 93, 98,
103, 108, 113, 123, 143, 153, 163, 173, 183, 193, 203, 223, 243, 253, 273, 281, 305,
310, 326, 331, 353, 363, 373, 381, 389, 405, 417, 425, and 439 and the amino acid

sequence encoded by the nucleotide sequence of any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, wherein the fragment comprises consecutive amino acid 5 residues corresponding to at least half of the full length of any of SEQ ID NOs: 3, 53, 73, 83, 93, 98, 103, 108, 113, 123, 143, 153, 163, 173, 183, 193, 203, 223, 243, 253, 273, 281, 305, 310, 326, 331, 353, 363, 373, 381, 389, 405, 417, 425, and 439 and the amino acid sequence encoded by the nucleotide sequence of any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220, 207221, 10 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764; and

f) a nucleic acid molecule which encodes a naturally occurring allelic variant of a polypeptide comprising the amino acid sequence of any of SEQ ID NOs: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-100, 103-105, 108-110, 113-115, 123- 15 131, 143-145, 153-160, 163, 173-175, 183-185, 193-198, 203-214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307, 310-315, 326-328, 331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-414, 417-422, 425-436, and 439, wherein the nucleic acid molecule hybridizes with a nucleic acid molecule consisting of the nucleotide sequence of any of SEQ ID NOs: 1, 2, 31, 32, 51, 52, 71, 72, 81, 82, 91, 20 92, 96, 97, 101, 102, 106, 107, 111, 112, 121, 122, 141, 142, 151, 152, 161, 162, 171, 172, 181, 182, 191, 192, 201, 202, 215, 217, 221, 222, 241, 242, 251, 252, 271, 272, 279, 280, 303, 304, 308, 309, 324, 325, 329, 330, 351, 352, 362, 371, 372, 379, 380, 387, 388, 403, 404, 415, 416, 423, 424, 437, 438, and the nucleotide sequence of any of the clones deposited as ATCC® Accession numbers 207184, 207219, 25 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a complement thereof under stringent conditions.

2. The isolated nucleic acid molecule of claim 1, which is selected from the group consisting of:

a) a nucleic acid having the nucleotide sequence of any of SEQ ID NOs: 1, 2, 31, 32, 51, 52, 71, 72, 81, 82, 91, 92, 96, 97, 101, 102, 106, 107, 111, 112, 121,

5 122, 141, 142, 151, 152, 161, 162, 171, 172, 181, 182, 191, 192, 201, 202, 215, 217, 221, 222, 241, 242, 251, 252, 271, 272, 279, 280, 303, 304, 308, 309, 324, 325, 329, 330, 351, 352, 362, 371, 372, 379, 380, 387, 388, 403, 404, 415, 416, 423, 424, 437, 438, and the nucleotide sequence of any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220, 207221, 207228, 207230, PTA-147, 10 PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a complement thereof; and

b) a nucleic acid molecule which encodes a polypeptide having the amino acid sequence of any of SEQ ID NOs: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-100, 103-105, 108-110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-

15 185, 193-198, 203-214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307, 310-315, 326-328, 331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-414, 417-422, 425-436, and 439 and the amino acid sequence encoded by the nucleotide sequence of any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, 20 PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a complement thereof.

3. The nucleic acid molecule of claim 1, further comprising vector nucleic acid sequences.

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4. The nucleic acid molecule of claim 1 further comprising nucleic acid sequences encoding a heterologous polypeptide.

5. A host cell which contains the nucleic acid molecule of claim 1.

6. The host cell of claim 5 which is a mammalian host cell.

5 7. A non-human mammalian host cell containing the nucleic acid
molecule of claim 1.

8. An isolated polypeptide selected from the group consisting of:

a) a fragment of a polypeptide comprising the amino acid sequence of any of
10 SEQ ID NOS: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-100, 103-105, 108-
110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-185, 193-198, 203-
214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307, 310-315, 326-328,
331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-414, 417-422, 425-
436, and 439 and the amino acid sequence encoded by the nucleotide sequence of
15 any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220,
207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-
438, PTA-455, PTA-817, PTA-1156, and PTA-1764;

b) a naturally occurring allelic variant of a polypeptide comprising the amino
acid sequence of any of SEQ ID NOS: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95,
20 98-100, 103-105, 108-110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-
185, 193-198, 203-214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307,
310-315, 326-328, 331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-
414, 417-422, 425-436, and 439, wherein the polypeptide is encoded by a nucleic
acid molecule which hybridizes with a nucleic acid molecule consisting of the
25 nucleotide sequence of any of SEQ ID NOS: 1, 2, 31, 32, 51, 52, 71, 72, 81, 82, 91,
92, 96, 97, 101, 102, 106, 107, 111, 112, 121, 122, 141, 142, 151, 152, 161, 162,
171, 172, 181, 182, 191, 192, 201, 202, 215, 217, 221, 222, 241, 242, 251, 252, 271,
272, 279, 280, 303, 304, 308, 309, 324, 325, 329, 330, 351, 352, 362, 371, 372, 379,

380, 387, 388, 403, 404, 415, 416, 423, 424, 437, 438, and the nucleotide sequence
of any of the clones deposited as ATCC® Accession numbers 207184, 207219,
207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-
424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a complement
5 thereof under stringent conditions; and
c) a polypeptide which is encoded by a nucleic acid molecule comprising a
nucleotide sequence which is at least 90% identical to a nucleic acid consisting of the
nucleotide sequence of any of SEQ ID NOs: 1, 2, 31, 32, 51, 52, 71, 72, 81, 82, 91,
92, 96, 97, 101, 102, 106, 107, 111, 112, 121, 122, 141, 142, 151, 152, 161, 162,
10 171, 172, 181, 182, 191, 192, 201, 202, 215, 217, 221, 222, 241, 242, 251, 252, 271,
272, 279, 280, 303, 304, 308, 309, 324, 325, 329, 330, 351, 352, 362, 371, 372, 379,
380, 387, 388, 403, 404, 415, 416, 423, 424, 437, 438, and the nucleotide sequence
of any of the clones deposited as ATCC® Accession numbers 207184, 207219,
207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-
15 424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a complement
thereof.

9. The isolated polypeptide of claim 8 having the amino acid
sequence of any of SEQ ID NOs: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-
20 100, 103-105, 108-110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-
185, 193-198, 203-214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307,
310-315, 326-328, 331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-
414, 417-422, 425-436, and 439 and the amino acid sequence encoded by the
nucleotide sequence of any of the clones deposited as ATCC® Accession numbers
25 207184, 207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151,
PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764.

10. The polypeptide of claim 8, wherein the amino acid sequence of
the polypeptide further comprises heterologous amino acid residues.

11. An antibody which selectively binds with the polypeptide of
5 claim 8.

12. A method for producing a polypeptide selected from the group
consisting of:

a) a polypeptide comprising the amino acid sequence of any of SEQ ID NOs:
10 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-100, 103-105, 108-110, 113-115,
123-131, 143-145, 153-160, 163, 173-175, 183-185, 193-198, 203-214, 216, 223-
236, 243-252, 253, 273-278, 281-302, 305-307, 310-315, 326-328, 331-333, 353-
358, 363-368, 373-378, 381-386, 389-394, 405-414, 417-422, 425-436, and 439 and
the amino acid sequence encoded by the nucleotide sequence of any of the clones
15 deposited as ATCC® Accession numbers 207184, 207219, 207220, 207221, 207228,
207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455,
PTA-817, PTA-1156, and PTA-1764;

b) a polypeptide comprising a fragment of the amino acid sequence of any of
SEQ ID NOs: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95, 98-100, 103-105, 108-
20 110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-185, 193-198, 203-
214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307, 310-315, 326-328,
331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-414, 417-422, 425-
436, and 439 and the amino acid sequence encoded by the nucleotide sequence of
any of the clones deposited as ATCC® Accession numbers 207184, 207219, 207220,
25 207221, 207228, 207230, PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-
438, PTA-455, PTA-817, PTA-1156, and PTA-1764, wherein the fragment
comprises at least 10 contiguous amino acids of any of SEQ ID NOs: 3-8, 33, 35, 38,
53-60, 73-78, 83-85, 93-95, 98-100, 103-105, 108-110, 113-115, 123-131, 143-145,

153-160, 163, 173-175, 183-185, 193-198, 203-214, 216, 223-236, 243-252, 253,
273-278, 281-302, 305-307, 310-315, 326-328, 331-333, 353-358, 363-368, 373-
378, 381-386, 389-394, 405-414, 417-422, 425-436, and 439 and the amino acid
sequence encoded by the nucleotide sequence of any of the clones deposited as
5 ATCC® Accession numbers 207184, 207219, 207220, 207221, 207228, 207230,
PTA-147, PTA-150, PTA-151, PTA-295, PTA-424, PTA-438, PTA-455, PTA-817,
PTA-1156, and PTA-1764; and

c) a naturally occurring allelic variant of a polypeptide comprising the amino acid sequence of any of SEQ ID NOs: 3-8, 33, 35, 38, 53-60, 73-78, 83-85, 93-95,
10 98-100, 103-105, 108-110, 113-115, 123-131, 143-145, 153-160, 163, 173-175, 183-
185, 193-198, 203-214, 216, 223-236, 243-252, 253, 273-278, 281-302, 305-307,
310-315, 326-328, 331-333, 353-358, 363-368, 373-378, 381-386, 389-394, 405-
414, 417-422, 425-436, and 439, or a complement thereof, wherein the polypeptide
is encoded by a nucleic acid molecule which hybridizes with a nucleic acid molecule
15 consisting of the nucleotide sequence of any of SEQ ID NOs: 1, 2, 31, 32, 51, 52, 71,
72, 81, 82, 91, 92, 96, 97, 101, 102, 106, 107, 111, 112, 121, 122, 141, 142, 151,
152, 161, 162, 171, 172, 181, 182, 191, 192, 201, 202, 215, 217, 221, 222, 241, 242,
251, 252, 271, 272, 279, 280, 303, 304, 308, 309, 324, 325, 329, 330, 351, 352, 362,
371, 372, 379, 380, 387, 388, 403, 404, 415, 416, 423, 424, 437, 438, and the
20 nucleotide sequence of any of the clones deposited as ATCC® Accession numbers
207184, 207219, 207220, 207221, 207228, 207230, PTA-147, PTA-150, PTA-151,
PTA-295, PTA-424, PTA-438, PTA-455, PTA-817, PTA-1156, and PTA-1764, or a
complement thereof under stringent conditions;

the method comprising culturing the host cell of claim 5 under conditions in
25 which the nucleic acid molecule is expressed.

13. A method for detecting the presence of a polypeptide of claim 8
in a sample, comprising:

a) contacting the sample with a compound which selectively binds with a polypeptide of claim 8; and

b) determining whether the compound binds with the polypeptide in the sample.

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14. The method of claim 13, wherein the compound which binds with the polypeptide is an antibody.

10 15. A kit comprising a compound which selectively binds with a polypeptide of claim 8 and instructions for use.

16. A method for detecting the presence of a nucleic acid molecule of claim 1 in a sample, comprising the steps of:

15 a) contacting the sample with a nucleic acid probe or primer which selectively hybridizes with the nucleic acid molecule; and
b) determining whether the nucleic acid probe or primer binds with a nucleic acid molecule in the sample.

20 17. The method of claim 16, wherein the sample comprises mRNA molecules and is contacted with a nucleic acid probe.

18. A kit comprising a compound which selectively hybridizes with a nucleic acid molecule of claim 1 and instructions for use.

25 19. A method for identifying a compound which binds with a polypeptide of claim 8 comprising the steps of:

a) contacting a polypeptide, or a cell expressing a polypeptide of claim 8 with a test compound; and

b) determining whether the polypeptide binds with the test compound.

20. The method of claim 19, wherein the binding of the test
compound to the polypeptide is detected by a method selected from the group
5 consisting of:

- a) detection of binding by direct detecting of test compound / polypeptide binding;
- b) detection of binding using a competition binding assay;
- c) detection of binding using an assay for an activity characteristic of the

10 polypeptide.

21. A method for modulating the activity of a polypeptide of claim 8 comprising contacting a polypeptide or a cell expressing a polypeptide of claim 8 with a compound which binds with the polypeptide in a sufficient concentration to
15 modulate the activity of the polypeptide.

22. A method for identifying a compound which modulates the activity of a polypeptide of claim 8, comprising:

- a) contacting a polypeptide of claim 8 with a test compound; and
- b) determining the effect of the test compound on the activity of the polypeptide to thereby identify a compound which modulates the activity of the polypeptide.

23. An antibody substance which selectively binds with the
25 polypeptide of claim 8.

24. A method of making an antibody substance which selectively binds with the polypeptide of claim 8, the method comprising providing the polypeptide to an

immunocompetent vertebrate and thereafter harvesting from the vertebrate blood or serum comprising the antibody substance.

25. A method of making an antibody substance which selectively binds
5 with the polypeptide of claim 8, the method comprising contacting the polypeptide with a plurality of particles which individually comprise an antibody substance and a nucleic acid encoding the antibody substance, segregating a particle which selectively binds with the polypeptide, and expressing the antibody substance from the nucleic acid of the segregated particle.

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26. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 2.

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27. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 52.

28. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 72.

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29. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence of one of SEQ ID NOs: 82, 92, 97, 102, 107, and 112.

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30. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 122.

31. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 142.

32. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 152.

5 33. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 172.

34. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 192.

10 35. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 202.

15 36. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 222.

37. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 272.

20 38. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 280.

39. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 304.

25 40. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 309.

41. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 325.

5 42. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 330.

10 43. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 372.

15 44. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 380.

20 45. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 388.

25 46. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 404.

30 47. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 416.

35 48. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 424.

40 49. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 162.

50. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 182.

51. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 242.

52. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 252.

10 53. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 362.

54. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 352.

15 55. The isolated nucleic acid of claim 1, wherein the isolated nucleic acid comprises a portion having the nucleotide sequence SEQ ID NO: 438.

20 56. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 3.

57. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 53.

25 58. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 73.

59. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is one of SEQ ID NOs: 83, 93, 98, 103, 108, and 113.

5 60. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 123.

61. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 143.

10 62. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 153.

15 63. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 173.

64. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 193.

20 65. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 203.

66. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 223.

25 67. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 273.

68. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 281.

69. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 305.
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70. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 310.

10 71. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 326.

72. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 331.

15 73. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 373.

74. The isolated polypeptide of claim 8, wherein the amino acid
20 sequence of the isolated polypeptide is SEQ ID NO: 381.

75. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 389.

25 76. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 405.

77. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 417.

5 78. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 425.

79. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 163.

10 80. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 183.

15 81. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 243.

82. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 253.

20 83. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 363.

84. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 353.

25 85. The isolated polypeptide of claim 8, wherein the amino acid sequence of the isolated polypeptide is SEQ ID NO: 439.